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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/656,942	09/07/2000	SHINJIRO OKADA	684.3072	2276

5514 7590 07/03/2003

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

HON, SOW FUN

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 07/03/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/656,942

Applicant(s)

OKADA ET AL.

Examiner

Sow-Fun Hon

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 1 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 2-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1. 6) ☐ Other: _____.

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DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species II in Paper No. 7 is acknowledged. The traversal is on the ground(s) that each of claims 2-10 read on the elected species. This only affirms the restriction requirement since claims 2-10 are in Species II which is the elected species.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 2, 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Kanbe et al. (US 6,159,562)

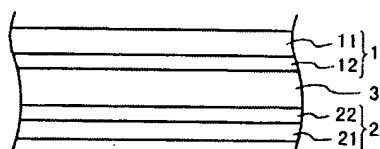
The applied reference has a common assignee, Canon Kabushiki Kaisha, a different inventive entity with one common inventor Takayashi Moriyama, with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived

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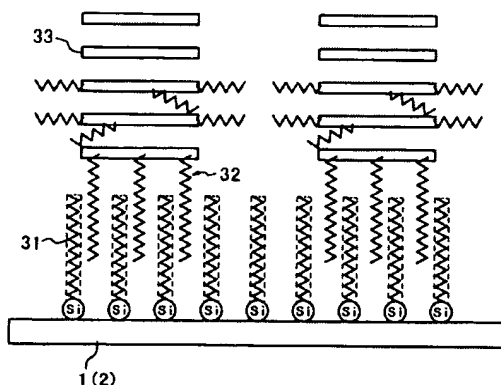
from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Kanbe et al. has a conductive liquid crystal device, comprising: a pair of oppositely spaced electrodes (electroconductive substrates 12, 22), and a carrier transporting layer disposed between the electrodes and in contact with one of the electrodes; wherein the carrier transporting layer comprises a conductive liquid crystal having a π -electron resonance structure in its molecule (discotic liquid crystal 3) (column 4, lines 25-60).

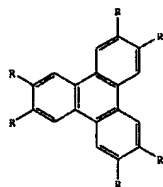
An embodiment of the liquid crystal device is shown below.



The triphenylene core 33 is aligned parallel with respect to the substrate surfaces 1(2) (column 3, lines 1-5 and column 6, lines 55-65). The triphenylene core as shown on the next page is planar (column 2, lines 1-35) and has a π -electron resonance (conjugated) structure (column 7, lines 1-10). Thus the π -electron resonance structure plane of the triphenylene core is aligned parallel to the surfaces of the electrodes.



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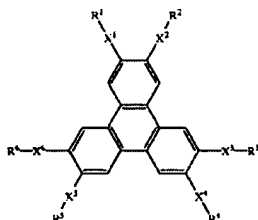
Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamano et al. (US 6,150,042) in view of Kanbe et al.

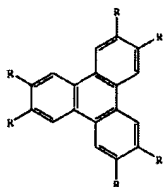
Tamano et al. has an organic electroluminescent device which has a plurality of organic compound thin layers including the light-emitting layer in lamination between a pair of electrodes (abstract, column 1, lines 45-70). The material is taught to be an amorphous thin film (column 76, lines 1-45) which implies that the laminated light-emitting layer (thin film) is also amorphous. The material has the triphenylene core structure below (column 2, lines 30-55) which is a conjugated π -electron resonance structure.



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Tamano et al. teaches that the material can also be used as an electron-transporting material for the electron-transporting layer by adding an electron-attracting substituent, but fails to teach that the electron-transporting material is a conductive liquid crystal which has the π -electron resonance structure plane of the conductive liquid crystal aligned parallel with the electrode substrates.

Kanbe et al. has been discussed above, and teaches the conductive liquid crystal device, comprising: a pair of oppositely spaced electrodes, and a carrier transporting layer disposed between the electrodes and in contact with one of the electrodes; wherein the carrier transporting layer comprises a conductive liquid crystal having a π -electron resonance structure in its molecule, and the π -electron resonance structure plane of the conductive liquid crystal in the carrier transporting layer is aligned parallel to the surfaces of the electrodes. Kanbe et al. teaches that this creates a preferential charge-transporting channel between substrates 1 and 2 normal to the substrates (column 6, lines 55-65) for more efficient charge transport. The triphenylene core structure with the conjugated π -electron resonance structure is shown below.



Kanbe et al. teaches that it is preferable to use a liquid crystal material which exhibits a discotic disordered phase in order to form a uniform homeotropic monodomain (column 5, lines 25-60).

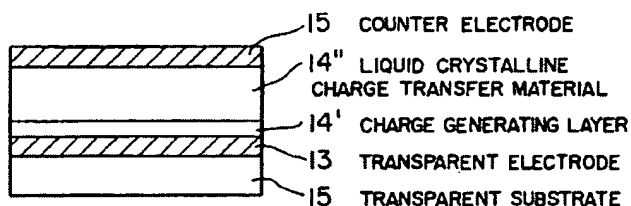
Since Kanbe et al. teaches that it is possible to form a light-emitting device including electron channels, or an electrochromic display device including ion channels with the

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replacement of layer 12 or 22 with a layer of material having a desired function for the intended purpose (column 4, lines 25-45), both of which can be electroluminescent devices, it would have been obvious to one of ordinary skill in the art to have used the aligned discotic liquid crystal with the triphenylene core of Kanbe et al. in place of the amorphous triphenylene core material in the electron transporting layer in the invention of Tamano et al. in order to obtain an electroluminescent device with higher efficiency of electron transport.

6. Claims 3-5, 7-10, 12, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanna et al. (US 5,766,510) in view of Kanbe et al.

Hanna et al. teaches an organic electroluminescence device comprising: a pair of oppositely spaced electrodes (13, 15), and a carrier transporting layer (14'' charge transfer) and a luminescent organic layer (14' charge generating) disposed in lamination between the electrodes so that the carrier transporting layer is disposed in contact with one of the electrodes. The liquid crystalline charge transport materials have conjugated π -electron resonance structures (aromatic ring of 6 π electron system).n where n is an integer of 1 to 4 and exhibit smectic liquid crystallinity. Hanna et al. teaches that these liquid crystalline charge transport materials are used in electroluminescence devices by virtue of having excellent charge transport properties (column 7, lines 40-60).



Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). In the instant case, in the absence of a showing of unexpected results, it is the examiner's position that vacuum deposition of the layers provides for layers that are the same or similar to other known methods of layer deposition.

Hanna et al. fails to teach that the π -electron resonance structure plane of the conductive liquid crystal in the carrier transporting layer is aligned parallel to the surfaces of the electrodes.

Kanbe et al. has been discussed above, and teaches a conductive liquid crystal device, comprising: a pair of oppositely spaced electrodes, and a charge (carrier) transporting layer disposed between the electrodes and in contact with one of the electrodes; wherein the charge (carrier) transporting layer comprises a conductive liquid crystal having a π -electron resonance structure in its molecule, and the π -electron resonance structure plane of the conductive liquid crystal in the carrier transporting layer is aligned parallel to the surfaces of the electrodes. This creates a preferential charge-transporting channel between substrates 1 and 2 normal to the substrates (column 6, lines 55-65) for more efficient charge transport.

Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the

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prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). In the instant case, in the absence of a showing of unexpected results, it is the examiner's position that the method of effecting parallel alignment of the π -electron resonance structure plane of the conductive liquid crystal to the electrode substrates as taught by Kanbe et al. results in the same or similar quality of alignment as that effected by heat treatment.

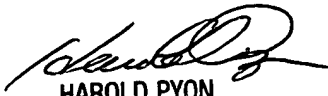
Since Kanbe et al. is directed to a liquid crystal device which can be an electroluminescent device, it would have been obvious to one of ordinary skill in the art to have used the method of parallel alignment of the π -electron resonance structure plane of the conductive liquid crystal to the electrode surfaces as taught by Kanbe et al. to align the π -electron resonance structure plane of the conductive liquid crystal in the invention of Hanna et al. in order to obtain an electroluminescent device with higher charge transport efficiency.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (703)308-3265. The examiner can normally be reached Monday to Friday from 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (703)308-4251. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

SH
Sow-Fun Hon
06/28/03


HAROLD PYON
SUPERVISORY PATENT EXAMINER
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6/27/03